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HEALTH ASPECTS OF OZONE LAYER DEPLETION

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EFFECTS OF ULTRA-VIOLET RADIATION ON HUMAN HEALTH

Abstract*/

The effects of ultra-violet radiation on human health may be beneficial as well as adverse. The paper outlines the different aspects of solar ultra-violet radiation without, however, attempting to make a final assessment of the risks and benefits, as a detailed evaluation of existing information is in progress and will be the subject of a criteria document to be reviewed by a WHO group of experts in 1978.

A well-established beneficial effect of ultra-violet radiation on human skin is the conversion of 7-hydrocholesterol to vitamin D. There has also been renewed interest in the understanding of other potentially beneficial biological effects of ultra-violet radiation. Aspects of adverse effects of ultra-violet radiation discussed in the paper include the acute effects on human skin and eyes, the experimental production of skin cancer, long-term exposure effects such as "skin aging" and non-melanoma and melanoma skin cancer; the incidence of skin cancer in different populations and in various geographical locations, and the role of sunlight in the etiology of malignant melanoma. The epidemiological evidence is insufficient to make reliable estimates of the possible increase in the incidence of skin cancer in various parts of the world. An example is nevertheless given in the paper.

Various theoretical calculations attempting to relate the potential decrease in stratospheric ozone and a possible increase in ultra-violet radiation to an increased incidence of skin cancer have led to the conclusion that there might be a physical amplification factor of 2, a biological amplification of 2 and a total amplification factor of 4. It was pointed out that any increase in the incidence of skin cancer would occur gradually as a new ozone equilibrium is attained, so that a new level of skin cancer incidence would be reached in about a century.

It is proposed to develop the activities of WHO and the International Agency for Research on Cancer along the following lines:

- Collection and evaluation of data on the biological and other health effects of ultra-violet radiation with a view to establishing dose/effect and dose/response relationships summarized in a criteria document;
- Continuous collection of data on skin cancer incidence in different parts of the world and the promotion of relevant epidemiological and experimental research;
- Evaluation of the possible direct effects of fluorocarbons on human health.

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